CHAPTER 10: GEOLOGY, SOILS AND WATER

Figures (Volume 2 of this EIA Report)

Technical Appendices (Volume 4 of this EIA Report)

10. GEOLOGY, SOILS AND WATER

Executive Summary

10.1.1 An assessment has been undertaken of the potential effects on geology, soils and water during the construction and operational phases of the Proposed Development. The assessment has also considered the potential effects of dismantling and rerouting of existing Overhead Lines on geology, soils and water.

10.1.2 Information for the study area was compiled using baseline information from a desk study and which was verified by an extensive programme of field work. The field work included investigation of private and public water supply sources to determine those which might be hydrologically connected to, and, at risk from the Proposed Development. Measures required to protect these sources have been confirmed.

10.1.1 The assessment considers designated sites and where these are water dependant and have a potential hydraulic connection to the Proposed Development.

10.1.2 The assessment undertaken considered the sensitivity of receptors identified during the baseline study and mitigation measures incorporated in the development design. It has also considered potential future changes to baseline conditions.

10.1.3 The scope of the assessment was informed by pre-application advice, scoping responses provided by The Highland Council (THC), and consultation responses received during the route and alignment stages of the project.

10.1.4 The assessment is supported by Appendices that consider potential effects on peat, peat stability and private water supplies. A schedule of proposed permanent watercourse crossings associated with the Proposed Development is also provided as a Technical Appendix. The assessment also considers the potential effects on public water supply sources and on habitat which could be sustained by groundwater (Groundwater Dependent Terrestrial Ecosystems (GWDTE)).

10.1.5 Subject to adoption of best practice construction techniques and a site-specific Construction Environmental Management Plan (CEMP), no significant adverse effects on the water environment have been identified. The CEMP includes provision for drainage management plans which will be agreed with statutory consultees, including Scottish Environment Protection Agency (SEPA) and which will be used to safeguard water resources and manage flood risk. A commitment to deploy Sustainable Drainage Systems (SuDS) in these plans has been made. The CEMP also includes provision of a Pollution Prevention Plan which would also be agreed with statutory consultees including SEPA prior to any construction or dismantling works being undertaken.

10.1.6 The design of the Proposed Development has been informed by a detailed programme of peat depth probing as and required by NPF4 and it has been shown that wherever possible areas of deep peat have been avoided. The assessment of peat and carbon rich soils has considered all of the proposed infrastructure, including temporary and permanent access tracks. A project specific peat management plan has been prepared which confirms the soils disturbed by the development are limited in volume and that these soils can be readily and beneficially reused in restoration works.

10.1.7 Notwithstanding these safeguards, a programme of baseline and construction phase water quality monitoring is proposed which would be used to confirm that the Proposed Development does not have a significant effect on the water environment. The monitoring programme would also be used to ensure private water supplies, Drinking Water Protected Areas and Scottish Water supply sources are safeguarded. It is proposed that the monitoring programme is agreed with statutory consultees.

10.2 Introduction

10.2.1 This Chapter considers the potential effects of the Proposed Development on geology, soils and water during construction and operation. As described in **Chapter 3: Project Description** it is anticipated that the effects associated with the construction phase could be considered to be representative of the worst-case decommissioning effects on geology, soils and water. As such, a separate assessment of potential decommissioning effects is not included in this Chapter. Where likely significant effects are predicted during construction and operation, appropriate mitigation measures are proposed, and the significance of predicted residual effects are assessed.

10.2.2 The assessment should be read in conjunction with **Chapter 8: Terrestrial Ecology**. This Chapter also presents summary information from the following Appendices:

- Technical Appendix 10.1: Peat Management Plan;
- Technical Appendix 10.2: Peat Landslide Hazard Risk Assessment;
- Technical Appendix 10.3: Confidential - Drinking Water Protected Area and Private Water Supply Risk Technical Assessment; and
- Technical Appendix 10.4: Schedule of Permanent New Watercourse Crossings.

10.2.3 This assessment has been carried out by SLR Consulting Ltd (SLR). Production of this Chapter has been overseen and reviewed by Gordon Robb (BSc, MSc, MBA, C.WEM, FCIWEM). Gordon is a Technical Director (Hydrology and Hydrogeology) and has more than 30 years' experience assessing renewable energy and electrical infrastructure projects and specifically their potential effects on soils, geology and the water environment. He is based in Scotland and has worked throughout Scotland, including on sites in similar settings to the Proposed Development. He has also prepared and given expert witness testimony for renewable and electrical infrastructure projects. A table presenting relevant qualifications and experience of key staff involved in the preparation of this Chapter is included in **Technical Appendix 4.1**, contained within Volume 4 of this EIA Report.

10.3 Scope of Assessment

Study Area

10.3.1 The study area encompasses the area over which all desk-based and field data were gathered to inform the assessment presented in this Chapter and includes a buffer of 500 m to all the proposed infrastructure OHL diversion works and access tracks that would be used during construction and maintenance of the Proposed Development.

Consultation Responses

10.3.2 To inform the scope of the assessment for the Proposed Development, consultation was undertaken with statutory and non-statutory bodies. **Table 10.1** summarises the responses relevant to this Chapter and provides information on where and/or how points raised have been addressed in this assessment.

10.3.3 Further details on the consultation and scoping responses can be found in **Chapter 5: Scoping and Consultation**, and associated appendices.

Table 10.1: Consultation Responses

Consultee & Date	Consultation Type	Response	Action
THC 1st December 2021	Pre Application Advice	Confirmed that the following supporting information should be submitted with any forthcoming application: (a) Drainage Impact Assessment (b) Flood Risk Assessment (c) GWDTE Assessment; (d) Peat Survey and Management Plan (e) Private Water Supply Assessment Further, NatureScot advised peatland surveys should be undertaken and peat landslide hazard risk assessment may be required. SEPA advised that any application should be supported by: - detailed peat surveys and calculations and areas of deep peat avoided; and - an NVC survey and assessment of GWDTE within a buffer of 250m of proposed infrastructure.	Principles for the control and management of drainage are presented in this Chapter and would be agreed with The Highland Council (THC) by the Principal Contractor prior to work commencing. Screening of flood risk sources is presented as part of the Baseline Assessment. A peat management plan and peat landslide hazard risk assessment is presented as **Technical Appendices 10.1** and **10.2**. A private water supply (and drawing water protected area) risk assessment is shown as **Technical Appendix 10.3**. NVC mapping is presented in **Chapter 8: Terrestrial Ecology** and an assessment of GWDTE in the Baseline Assessment section of this Chapter.
Forestry and Land Scotland West – 20th June 2022 and North – 15th August 2022	Route and Alignment Stage Consultation Response	Forestry Land Scotland (FLS) (West) confirmed potential impact is "considered to be manageable in forestry terms". FLS (North) raised no concern with regard to soils, geology or the water environment.	Noted. Measures proposed to safeguard water resources are provided in this Chapter. (Section 10.7 Embedded Mitigation and Mitigation by Design).
NatureScot 13th September 2022	Route and Alignment Stage Consultation Response	We recommend that the route options, design and layout of all elements of the project are informed by survey and assessment, seeking to avoid impacts to sensitive habitats such as blanket bog and other Annex 1 habitats wherever possible. Where impacts cannot be avoided we recommend they are mitigated as far as possible and restoration measures are proposed within Peatland and Habitat Management Plans.	A detailed programme of peat depth probing has been undertaken and informed the design of the Proposed Development. A peat management plan and peat landslide hazard risk assessment are presented as **Technical Appendices 10.1** and **10.2**.
Scottish Water 8th March 2023	Scoping Response	Confirmed no objection to the Proposed Development. Advised that the Proposed Development is located in two Drinking Water Protected Areas: The	An assessment of potential effects on Drinking Water Protection Areas has been completed and is presented as **Technical Appendix 10.3**.

Consultee & Date	Consultation Type	Response	Action
		Aldernaig Burn catchment supplies Invergarry Water Treatment Works (WTW) and Loch Ness supplies Invermoriston WTW, and that it is essential that water quality and water quantity in the area are protected.	
NatureScot 17th March 2023	Scoping Response	Impacts to the West Inverness-shire Lochs SPA and Gary Falls SSSI should be avoided and if avoidance of impacts is not possible, any impacts should be minimised through appropriate mitigation, details of which should be provided in the EIA Report (EIAR). Site specific surveys will be required to confirm the quality and distribution of peatland across the proposed development. Recommend that the alignment, layout and design is informed by habitat survey, hydrological assessment and peat probing results, so that it avoids direct and indirect impacts to priority peatland habitats. Where impacts cannot be avoided, they should be minimised, and direct and indirect impacts quantified.	Potential hydrological impacts Gary Falls SSSI and West Inverness-shire Lochs SPA are considered in this Chapter (Section 10.6, Baseline Conditions and Section 10.8 Assessment of Potential Likely Significant Effects). A detailed programme of peat depth probing and condition surveys have been completed and have informed the design of the Proposed Development, see **Chapter 8: Terrestrial Ecology** and peat management plan and peat landslide hazard risk assessment which are presented as **Technical Appendices 10.1** and **10.2**.
SEPA 24th March 2023	Scoping Response	Confirmed content with the approach to be taken to the scope and level of detail proposed in the EIA Report. The assessment should consider the requirements of NPF4 the application should clearly demonstrate how the mitigation hierarchy outlined in policy 5 has been applied. The application should include clear information on supporting infrastructure such as tracks. A NVC survey should be carried and impacts should be minimised as much as possible and good quality habitat avoided.	The distribution and quality of peat is considered in **Chapter 8: Terrestrial Ecology** and application of the mitigation hierarchy in the peat management plan presented as **Technical Appendix 10.1**. This also considers compliance with Policy 5 of NPF4 for all elements of the Proposed Development. The results of the NVC and potential impacts on wetland habitats are considered in **Chapter 8: Terrestrial Ecology**.

Potential Impacts

10.3.4 The following potential impacts have been assessed in full in relation to the Proposed Development (potential construction impacts noted below also include dismantling of the existing OHL):

- pollution risk, including potential impact on surface water and groundwater quality and public and private water supplies during construction and operation;
- erosion and sedimentation which could give rise to potential impact on surface water and groundwater quality, and private water supplies during construction and operation;

- fluvial flood risk resulting from changes to runoff volumes and rates and modifications to natural and man-made drainage patterns during operation;
- potential impact upon the linkage between groundwater and surface water during construction and operation;
- potential impact on areas of peat during construction and operation;
- potential impact on areas of GWDTE during construction and operation; and
- potential cumulative impact during construction and operation.

Issues Scoped Out of Assessment

10.3.5 On the basis of the desk based and survey work undertaken, policy, guidance and standards, the professional judgement of the EIA team, feedback from consultees and experience from other relevant projects, the following topic areas have been 'scoped out':

- With the exception of peat, effects on geology as no sensitive geological features have been identified within the proposed study area.
- Detailed Flood Risk and Drainage Impact Assessment. Published mapping confirms that virtually all of the Proposed Development is not located in an area identified as being at flood risk and where flood risk is recorded it is typically small in extent and bounds watercourse corridors. A simple screening of potential flooding sources (fluvial, coastal, groundwater, infrastructure etc.) is therefore presented and measures that would be used to control the rate and quality of runoff will be specified in the site-specific CEMP.
- Potential effects on the water environment associated with forest felling, as the extent of proposed felling is very small compared to the surface water catchments in which the felling would occur. Forest felling would also be undertaken in accordance with industry standard best practice with regard to minimising the potential for pollution and alteration of water drainage paths.
- Baseline water quality monitoring, as water quality data is published by SEPA and can be used to characterise baseline water quality in this assessment.
- Increased flood risk caused by blockages to flow in watercourses during operation and maintenance of the Proposed Development as any required permanent watercourse crossings would be subject to maintenance requirements under the Controlled Activity Regulations[1].
- A Geomorphological Assessment as photographs and records of baseline water features are recorded and presented in the EIA.
- Watercourse crossing assessment of temporary tracks which would be used as part of the construction phase of the Proposed Development, as measures to mitigate potential effects would be agreed in the site specific CEMP.

10.3.6 An assessment of potential cumulative effects associated with the Proposed Development and other proposed electrical transmission projects has also been 'scoped out' of the assessment. Other developments would also be designed, developed and managed in accordance with best practice, industry standards and relevant legalisation, planning policy and guidance regulated by statutory consultees. These standards ensure, with respect to the soils, geology and water environment, potential impacts are mitigated and controlled at source.

10.4 Legislation, Policy and Guidance

10.4.1 The aquatic environment in Scotland is afforded significant protection through key statutes and the regulatory activity of SEPA and the local authorities. Relevant legislation and guidance documents have been reviewed and considered as part of this assessment.

[1] The Water Environment (Controlled Activities) (Scotland) Amendment Regulations, 2013

Legislation Context

10.4.2 Relevant legislation includes:

- The Water Environment (Controlled Activities) (Scotland) Amendment Regulations, 2013 (CAR);
- EU Water Framework Directive (2000/60/EC);
- EU Drinking Water Directive (98/83/EC);
- The Environment Act 1995;
- Environmental Protection Act 1990;
- The Water Supply (Water Quality) (Scotland) Regulations, 2001;
- The Flood Risk Management (Scotland) Act 2009;
- Water Environment and Water Services (Scotland) Act 2003 (WEWS Act);
- Private Water Supplies (Scotland) Regulations 2006; and
- The Water Intended for Human Consumption (Private Supplies) (Scotland) Regulations 2017.

Policy Context

10.4.3 National Planning Framework 4 (NPF4) adopted by the Scottish Government on 13 February 2023 provides planning guidance and polices regarding sustainable development, tackling climate change and achieving net zero. Policy's relevant to this Chapter include:

- Policy 2 (Climate Mitigation and Adaptation);
- Policy 5 (Soils);
- Policy 20 (Blue and Green Infrastructure); and
- Policy 22 (Flood Risk and Water Management).

10.4.4 In addition, The Highland Council Local Development Plan (HwLDP) provides planning guidance on the type and location of development that can take place in the region. The HwLDP presents development polices of which the following are relevant to this assessment:

- Policy 53: Minerals;
- Policy 54: Mineral Wastes;
- Policy 55: Peat and Soils;
- Policy 60: Other Important Habitats and Article 10 Features;
- Policy 63: Water Environment;
- Policy 64: Flood Risk;
- Policy 66: Surface Water Drainage; and
- Policy 69: Electricity Transmission Infrastructure.

Technical Guidance

10.4.5 Planning Advice Notes (PANs) and Specific Advice Sheets, published by the Scottish Government, including of relevance to this assessment, including;

- PAN 61 Planning and Sustainable Urban Drainage Systems; and
- Online Planning Advice on Flood Risk (which supersedes PAN 69).

10.4.6 SEPA Pollution Prevention Guidance Notes (PPG) and Guidance of Pollution Prevention (GPP):

- GPP01: Understanding your environmental responsibilities – good environment practices;
- GPP02: Above ground oil storage;
- PPG03: Use and design of oil separators in surface water drainage systems;

- GPP05: Works and maintenance in or near water;
- PPG06: Working at construction and demolition sites;
- PPG07: Safe storage - the safe operation of refuelling facilities;
- GPP08: Safe storage and disposal of used oils;
- GPP13: Vehicle washing and cleaning;
- GPP21: Pollution incident response planning; and
- GPP22: Dealing with spills.

10.4.7 CIRIA publications:

- C532 Control of Water Pollution from Construction Sites (2001);
- C648 Control of Water Pollution from Linear Construction Projects – Technical Guidance (2006);
- C741 Environmental Good Practice on Site (2015);
- C753 The SUDS Manual (2015); and
- R179 Ground Engineering Spoil: Good Management Practice (1997).

10.4.8 SEPA publications:

- Engineering in the Water Environment: Good Practice Guide – River Crossings (2010);
- Engineering in the Water Environment: Good Practice Guide – Sediment Management (2010);
- Groundwater Protection Policy for Scotland, Version 3 (2009);
- Land Use Planning System SEPA Guidance Note 2a, Version 2 – Flood Risk (2018)
- Land Use Planning System SEPA Guidance Note 31, Version 3 – GWDTE (2017);
- Position Statement – Culverting of Watercourses, Version 2.0 (2015); and
- Regulatory Position Statement – Developments on Peat (2010).

10.4.9 Other publications:

- Scottish Government, Peat Landslide Hazard and Risk Assessments: Best Practice Guide for Proposed Electricity Generation Developments (2017);
- Forestry Commission Scotland & Scottish National Heritage, Floating Roads on Peat - Report into Good Practice in Design, Construction and Use of Floating Roads (2010);
- Institute of Civil Engineers, Managing Geotechnical Risk: Improving Productivity in UK Building and Construction (2001);
- Scottish Executive, Scottish Roads Network Landslides Study Summary Report (2005);
- Forestry Commission, Guidelines for the Risk Management of Peat Slips on the Construction of Low Volume/Low Cost Roads on Peat (2006);
- Department of Environment, Food and Rural Affairs (DEFRA) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (2011); and
- DEFRA Good Practice Guide for Handling Soils (Ministry of Agriculture, Fisheries and Food (MAFF) 2000).

10.5 Methodology

Desk Study

10.5.1 Much of the study area has been subject to previous review and assessment. Previous assessments which have been reviewed and have been used to inform characterisation of the baseline conditions include the following:

- Coire Glas Pump Storage Hydro Scheme (Original[2] and Revised[3] Scheme) EIA Reports;
- Bhlaraidh Extension Wind Farm Grid Connection[4] Environmental Appraisal;
- Skye Reinforcement Project[5] EIA Report; and
- Quoich to Aberchalder 132 kV woodpole OHL Environmental Appraisal[6].

10.5.2 An initial desk study has been undertaken to determine and confirm the baseline characteristics by reviewing available information relating to geology, soils and water. The following sources of information have been consulted to characterise and assess the baseline conditions within the study area:

- Ordnance Survey (OS) 1:50,000 and 1:25,000 scale mapping;
- Natural England MAGIC map[7];
- NatureScot SiteLink[8];
- Scottish Natural Heritage (now NatureScot) Carbon and Peatland 2016 Map[9];
- James Hutton Institute, The National Soil Map of Scotland (1:250,000) [10];
- British Geological Survey (BGS) Onshore GeoIndex (1:50,000)[11];
- BGS Hydrogeological maps of Scotland[12];
- Details of private water supplies provided by THC;
- SEPA flood maps[13]; and
- SEPA environmental data[14].

Field Survey

10.5.3 The project hydrologists, geologists and ecologists have worked closely on this assessment to ensure that appropriate information is gathered to allow a comprehensive impact assessment to be completed. Detailed site visits and walkover surveys have been undertaken by SLR on the following dates:

- February 2022, April 2022, May 2022 and February 2023 to collect peat depth and condition information; and
- April 2022 and February 2023 to collect data regarding private water supplies, Drinking Water Protected Areas, permanent watercourse crossings and assess potential areas of GWDTE.

[2] Planning Application ECU0003164
[3] Planning Application ECU00000577
[4] Planning Application ECU00004639
[5] Planning Application ECU000043395
[6] Planning Application 19/O1455/S37
[7] Natural England MAGIC map, available at https://magic.defra.gov.uk/MagicMap.aspx [Accessed February 2023]
[8] NatureScot SiteLink, available at https://sitelink.nature.scot/home [Accessed February 2023]
[9] Scottish Natural Heritage available at https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/ [Accessed February 2023]
[10] James Hutton Institute, National soil map of Scotland https://soils.environment.gov.scot/maps/ [Accessed February 2023]
[11] British Geological Survey GeoIndex (onshore), available at https://www.bgs.ac.uk/map-viewers/geoindex-onshore/ [Accessed February 2023]
[12] British Geological Survey Hydrogeological maps of Scotland, available at https://www.bgs.ac.uk/datasets/hydrogeological-maps-of-scotland/ [Accessed February 2023]
[13] SEPA Flood Maps, available at https://www.sepa.org.uk/environment/water/flooding/flood-maps/ [Accessed February 2023]
[14] SEPA Environmental data, available at https://www.sepa.org.uk/environment/environmental-data/ [Accessed February 2023]

10.5.4 The field work has been undertaken in order to:

- verify the information collected during the desk and baseline study;
- assess peat depths and condition, and undertaken geomorphological mapping;
- allow appreciation of the study area and undertake visual assessment of the main surface waters;
- identify and verify private water supplies and Drinking Water Protected Areas;
- identify drainage patterns, areas vulnerable to erosion or sedimentation deposition and any pollution risks;
- assess areas of potential GWDTE; and
- visit proposed new permeant watercourse crossings and prepare a schedule of these.

10.5.5 The scope of the private water supply survey was also informed by data received from THC, SEPA and review of assessments for neighbouring developments along with OS mapping and aerial photography as detailed in **Technical Appendix 10.3** (Drinking Water Protected Area and Private Water Supply Risk Assessment)**.** To complete the Private Water Supply Risk Assessment properties which may have or have a recorded private water supply downstream of the Proposed Development were visited and where possible the source of the water supply was verified and confirmed. Where this was not possible a questionnaire was left with the occupiers of the property and they were asked to provide details of their water supply. Their responses have been incorporated in the assessment. This has ensured a thorough assessment of private water supplies has been completed.

Assessment of Effects

10.5.6 The significance of effects of the Proposed Development has been assessed by considering two factors: the sensitivity of the receiving environment and the potential magnitude of impact, should that effect occur.

10.5.7 This approach provides a mechanism for identifying the areas where mitigation measures are required and for identifying mitigation measures appropriate to the significance of likely effects presented by the Proposed Development.

10.5.8 Criteria for determining the significance of effect are provided in **Table 10.2**, **Table 10.3** and **Table 10.4**.

Sensitivity / Importance of Receptors

10.5.9 The sensitivity of the receiving environment (i.e. the baseline quality of the receiving environment) is defined as its ability to absorb an effect without a detectable change and can be considered through a combination of professional judgement and a set of pre-defined criteria which is set out in **Table 10.2**.

10.5.10 Receptors in the receiving environment only need to meet one of the defined criteria to be categorised at the associated level of sensitivity.

Table 10.2: Criteria for Assessing Sensitivity of Receptor

Sensitivity	Definition
High	• soil type and associated land use is highly sensitive (e.g. unmodified blanket bog or peatland); • SEPA Water Framework Directive Water Body Classification: High-Good or is close to the boundary of a classification: Moderate to Good or Good to High; • receptor is of high ecological importance or National or International value (e.g. Site of Special Scientific Interest (SSSI), Special Area of Conservation (SAC), habitat for protected species) which may be dependent upon the hydrology of the Development Area;

Sensitivity	Definition
	• receptor is at high risk from flooding above 0.5% Annual Exceedance Probability (AEP) and/or water body acts as an active floodplain or flood defence; • receptor is used for public and/or private water supply (including Drinking Water Protected Areas); • groundwater vulnerability is classified as High; and • if a Groundwater Dependent Terrestrial Ecosystem or Geological Conservation Review site is present and identified as being of high sensitivity.
Medium	• soil type and associated land use moderately sensitive (e.g. arable, commercial forestry); • SEPA Water Framework Directive Water Body Classification: Moderate or is close to the boundary of a classification: Low to Moderate; • receptor is at moderate risk from flooding (0.1% AEP to 0.5% AEP) but does not act as an active floodplain or flood defence; and • moderate classification of groundwater aquifer vulnerability.
Low	• soil type and associated land use not sensitive to change in hydrological regime and associated land use (e.g. intensive grazing of sheep and cattle); • SEPA Water Framework Directive Water Body Classification: Poor or Bad; • receptor is at low risk from flooding (less than 0.1% AEP); and • receptor not used for water supplies (public or private).
Negligible	• receptor would not be affected by the proposed development e.g. lies within a different and unconnected hydrological / hydrogeological catchment.

Magnitude of Effect

10.5.11 The potential magnitude of effect would depend upon whether the potential effect would cause a fundamental, material or detectable change. In addition, the timing, scale, size and duration of the potential effect resulting from the Proposed Development are also determining factors. The criteria that have been used to assess the magnitude of impact are defined in **Table 10.3**.

Table 10.3: Criteria for Assessing Magnitude of Effect

Magnitude	Criteria	Definition
Major	Results in a loss of attribute	Fundamental (long term or permanent) changes to the baseline soils, geology, hydrology, hydrogeology and water quality such as: • permanent degradation and total loss of soils, peatland habitat or protected geological features; • wholesale changes to watercourse channel, route, hydrology or hydrodynamics; • changes to the site resulting in an increase in runoff with flood potential and also significant changes to erosion and sedimentation patterns; • major changes to the water chemistry; and • major changes to groundwater levels, flow regime and risk of groundwater flooding.
Moderate	Results in impact on integrity of attribute or loss	Material but non-fundamental and short to medium term changes to baseline soils, geology, hydrology, hydrogeology and water quality, such as: • loss of extensive areas of soils or peat habitat, damage to important geological structures/features;

Magnitude	Criteria	Definition
	of part of attribute	• some fundamental changes to watercourses, hydrology or hydrodynamics; • changes to site resulting in an increase in runoff within system capacity; • moderate changes to erosion and sedimentation patterns; • moderate changes to the water chemistry of surface runoff and groundwater; and • moderate changes to groundwater levels, flow regime and risk of groundwater flooding.
Minor	Results in minor impact on attribute	Detectable but non-material and transitory changes to the baseline soils, geology, hydrology, hydrogeology and water quality, such as: • minor or slight loss of soils, peatland or slight damage to geological structures / features; • minor or slight changes to the watercourse, hydrology or hydrodynamics; • changes to site resulting in slight increase in runoff well within the drainage system capacity; • minor changes to erosion and sedimentation patterns; • minor changes to the water chemistry of surface runoff and groundwater; and • minor changes to groundwater levels, flow regime and risk of groundwater flooding.
Negligible	Results in an impact on attribute but of insignificant magnitude to affect the use / integrity	No perceptible changes to the baseline soils, geology, hydrology, hydrogeology and water quality such as: • no impact or alteration to existing important soils, peatland or geological environs; • no alteration or very minor changes with no impact to watercourses, hydrology, hydrodynamics, erosion and sedimentation patterns; • no pollution or change in water chemistry to either groundwater or surface water; and • no alteration to groundwater recharge or flow mechanisms.

Significance of Effect

10.5.12 The sensitivity of the receiving environment together with the magnitude of the effect determines the significance of the effect, which can be categorised into levels of significance as identified in **Table 10.4**.

10.5.13 **Table 10.4** provides a guide to assist in decision making. However, it should not be considered as a substitute for professional judgment and interpretation. In some cases, the potential sensitivity of the receiving environment or the magnitude of potential impact cannot be quantified with certainty and, therefore, professional judgement remains the most robust method for identifying the predicted significance of a potential effect.

Table 10.4: Significance of Effect

Magnitude of Effect	Sensitivity			
	High	Medium	Low	Negligible
Major	**Major**	**Major**	**Moderate**	Negligible

Magnitude of Effect	Sensitivity			
	High	Medium	Low	Negligible
Moderate	**Moderate**	**Moderate**	Minor	Negligible
Minor	**Moderate**	Minor	Minor	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

10.5.14 Effects of '**Major**' and '**Moderate**' significance are considered to be 'significant' in terms of the EIA Regulations.

Limitations to the Assessment

10.5.15 The assessment uses site investigation, survey data and publicly available data sources, including but not limited to SEPA, THC and commercial data supply companies, as well as additional information supplied from stakeholders during the scoping and consultation stages.

10.5.16 It is considered that the data and information used to complete this assessment is robust and that there are no significant data gaps or limitations.

10.6 Baseline Conditions

10.6.1 This section outlines the baseline soils (including peat), geology and water conditions within the study area. The study area is shown on **Figure 10.1**

Designations

10.6.2 Review of the NatureScot SiteLink, as shown on **Figure 10.1**, indicates that there are two designated sites within the study area, these are:

- Western Inverness-shire Lochs Site of Special Scientific Interest (SSSI) and Special Protection Area (SPA). A 2,968 ha site which comprises eight freshwater lochs including Loch Garry and Loch Lundie, designated for breeding black throated divers and common scoters, and their breeding habitats. Loch Garry and Loch Lundie are located within the same hydrological catchments of the Proposed Development and therefore impacts to the SSSI and SPA associated with Loch Garry and Loch Lundie are discussed further below. Potential ornithological impacts are assessed in **Chapter 9: Ornithology.**
- Garry Falls SSSI. A 1.78 ha site which encompasses a good example of upland mixed ash woodland and supports a rich bryophyte assemblage. It is located upstream of the Proposed Development and therefore not in hydraulic continuity with the development. It is not considered further in this assessment.

10.6.3 South Laggan Fen SSSI is not located within the study area. It is located on the southern shore of Great Glen and sufficiently remote from the Proposed Development regarding soils, geology and water so as not to be considered at risk from it. It is, therefore, not considered further in this assessment.

Geology and Soils

<u>Soils</u>

10.6.4 An extract of 1:250,000 National Soil Map of Scotland is presented as **Figure 10.2** and shows the Proposed Development is underlain by peaty podzols, brown soils, and mineral podzols.

<u>Peat and Superficial Geology</u>

10.6.5 Review of Peatland Classification mapping (**Figure 10.3)** confirms that the Proposed Development is not located within an area comprising priority peatland habitat (Class 1 and/or Class 2).

10.6.6 To inform the design of the Proposed Development a comprehensive programme of peat depth probing and characterisation has been undertaken to confirm the extent and distribution of peat. The results of these investigations are reported in **Technical Appendix 10.1** (Peat Management Plan) which, in summary, confirms:

- peat depth probing has been undertaken at more than 2,000 locations and has included assessing peat depths and extents beneath all elements of proposed permanent infrastructure
- peat, where recorded is noted to be generally fibrous;
- in accordance with NPF4 the Proposed Development avoids areas of deep peat.

10.6.7 The management of organic soils and peat, and an assessment of peat landslide hazard risk are considered in detail in **Technical Appendix 10.1** (Peat Management Plan) and **Technical Appendix 10.2** (Peat Landslide Hazard Risk Assessment).

10.6.8 The BGS Onshore GeoIndex for Superficial Geology (**Figure 10.4**) indicates that superficial geology is absent beneath much of the Proposed Development. The northernmost part of the Proposed Development is underlain by glaciofluvial sheet deposits (sand, gravel and boulders). Discrete areas of hummocky glacial deposits (diamicton – sand and gravel), alluvium and river terrace deposits (gravel, sand, silt and clay) and small areas of peat are noted elsewhere within the study area. The alluvium and river terrace deposits are typically located at lower elevations and bound larger watercourses.

Bedrock Geology

10.6.9 Review of the BGS Onshore GeoIndex for Bedrock Geology (**Figure 10.5**) confirms that the study area is underlain by the West Highland Granite Gneiss Intrusion (a granite gneissose) and the Tarvie Psammite Formation (psammite).

10.6.10 Numerous minor igneous intrusions are also recorded locally and within the study area.

Hydrogeology

Groundwater Levels and Flow

10.6.11 Superficial geology comprising glacial hummock deposits and peat superficial deposits are not considered important aquifers. Small amounts of groundwater may be present within the sand and gravel horizons of the glacial superficial deposits; however groundwater yields are likely to be low given limited lateral and vertical extent of these horizons. Peat is characterised by a low bulk permeability, and does not, therefore readily permit water movement.

10.6.12 There is potential for shallow groundwater storage and movement in the more permeable glaciofluvial sheet deposits, alluvium and river terrace deposits. It is likely that this groundwater will be in hydraulic continuity with nearby surface water (watercourses and lochs).

10.6.13 Aquifer Productivity mapping is presented as **Figure 10.7** and confirms the bedrock geology is characterised as a low productivity aquifer. Any groundwater storage and movement is likely to be restricted to the upper weathered surface of the bedrock and occur in factures and fissures at depth. Groundwater flow in the upper weathered surface is likely to follow topography. The low bulk permeability of the bedrock prevent large scale groundwater storage.

10.6.14 It is understood that SEPA do not maintain any groundwater monitoring locations within the study area.

10.6.15 Groundwater Vulnerability mapping (**Figure 10.8**) classifies the underlying aquifer (superficial and bedrock) according to the predominant groundwater flow mechanism (fracture or intergranular) and the estimated groundwater productivity. Groundwater vulnerability is divided into five classes (1 to 5) with 1 being least vulnerable and 5 being most vulnerable.

10.6.16 Review of **Figure 10.8** indicates that the superficial deposits within the study area are generally not considered a significant aquifer, with exception of the higher permeability deposits of alluvium and river terrace deposits found adjacent to the River Oich and River Garry which are characterised with medium to high productivity with intergranular groundwater flow. The bedrock aquifer is confirmed as a very low productivity aquifer, where groundwater flow can occur in fractures.

10.6.17 The majority of the Proposed Development is shown (**Figure 10.8**) to be underlain by groundwater vulnerability Classes 5, 4a and 4b, and reflects the shallow depth of groundwater. A small area of Class 3 groundwater vulnerability is noted towards the northern part of the study area.

10.6.18 Baseline factors that inhibit groundwater recharge regionally include the following:

- steep topographic gradients that encourage formation of surface water runoff;
- glacial till and peat where present limit infiltration of rainwater as a result of their characteristic low bulk permeability; and
- the underlying bedrock (where not weathered or fractured) generally displays a low or negligible permeability that limit groundwater recharge.

10.6.19 This is witnessed by the high density of surface watercourses shown on **Figure 10.1** and which confirm that the majority of incident rainfall forms surface water runoff locally and regionally.

Groundwater Quality

10.6.20 All of Scotland's groundwater bodies have been designated as Drinking Water Protected Areas (DWPA) under the Water Environment (Drinking Water Protected Area) (Scotland) Order 2013 and require protection for their current use or future potential as drinking water resources.

10.6.21 The current status of groundwater bodies in Scotland has been classified by SEPA in accordance with the requirements of the Water Framework Directive (WFD). The Proposed Development is underlain by the Northern Highlands groundwater body (SEPA ID 150701), which has been classified as having a Good overall groundwater quality in 2020 (the latest reporting cycle). No pressures have been identified by SEPA for this groundwater waterbody.

10.6.22 SEPA has confirmed that they do not hold any specific groundwater water quality data within the study area.

Groundwater Dependent Terrestrial Ecosystems

10.6.23 A summary of the habitat surveys completed is provided in **Chapter 8: Terrestrial Ecology** along with a detailed National Vegetation Classification (NVC) habitat plan and has been used to inform the assessment of the GWDTE.

10.6.24 With reference to the Proposed Development **Chapter 8: Terrestrial Ecology** assesses potential effects on GWDTE and confirms no significant effects are anticipated.

10.6.25 Given the location of the Proposed Development and the nature of the underlying soils and geology it is likely that areas of potential GWDTE are sustained by rainfall and water logging of soils, rather than by groundwater. Buffers to areas of potential GWDTE specified in SEPA guidance therefore do not apply, but safeguards to

maintain these habitats, and the source of water to these habitats will need to be maintained during construction and operation of the Proposed Development.

Hydrology

10.6.26 The local hydrology is shown on **Figure 10.1.** The Proposed Development is located within two principal surface water catchments: the River Garry in the west and the River Oich in the east. Both are part of the larger River Ness catchment. The whole of Loch Ness and its immediate catchment has been designated as a DWPA.

10.6.27 The Aldernaig Burn is a tributary of the River Garry and drains much of the west of the Section. Its catchment is designated as a DWPA. Loch Lundie (which is a component of West Inverness-shire Lochs SSSI) is also located in the Aldernaig Burn catchment. The location and extent of the DWPA is shown on **Figure 10.1**.

10.6.28 The risk the Proposed Development poses to the DWPAs has been considered as part of this assessment.

10.6.29 Much of the east part of the Proposed Development is drained by the surface water catchment of the Invervigar Burn which is a tributary of the River Oich.

Surface Water Quality

10.6.30 Water quality in the Aldernaig Burn, River Garry, Invervigar Burn, River Oich and Loch Oich is monitored by SEPA and classified annually in accordance with the requirements of the WFD. **Table 10.5** provides summary details of the SEPA classifications reported in 2020 (the latest reporting cycle). The watercourses/features are classified with an overall status of Moderate to High.

10.6.31 Smaller watercourses within the study area are not monitored by SEPA.

Table 10.5: SEPA Surface Water Classification (2020)

Watercourse (SEPA ID)	Overall Status	Overall Ecology	Physico-Chemical Status	Hydromorphology	Pressure
River Garry (20254)	Good	Moderate	Good	Moderate	Heavily modified as a result of hydroelectricity generation.
Aldernaig Burn (23643)	Moderate	Moderate	-	Good	Unknown pressure on water animals and plants.
Invervigar Burn (20293)	High	High	High	High	None
River Oich (20253)	Good	Good	-	Good	None
Loch Oich (100188)	Good	Good	High	Good	None

Fisheries

10.6.32 Fisheries within the River Ness catchment are managed by the Ness District Salmon Fisheries Board (NDSFB) and Ness and Beauly Fisheries Trust.

Watercourse Crossings

10.6.33 The Proposed Development has sought to utilise existing tracks and access routes wherever possible. However, eight new permanent watercourse crossings, eight existing crossings on tracks which are scheduled to be upgraded or existing bridges to be upgraded would be used, and two new temporary bridges will be required. The locations of the proposed permanent crossings are shown on **Figure 10.1** and a schedule of these crossings points, which includes photographs and dimensions of each crossing, is shown in **Technical Appendix 10.4** (Schedule of Permanent Watercourse Crossings).

Flood Risk

10.6.34 SEPA has developed national flood maps that present modelled flood extents for river, coastal, surface water and groundwater flooding. The river, coastal, surface water and groundwater maps were developed using a consistent methodology to produce outputs for the whole of Scotland, supplemented with more detailed, local assessments where available and suitable for use. Flood extents are presented in three likelihoods: High, Medium and Low.

- High likelihood: a flood event is likely to occur in the defined area on average more than once in every ten years (1:10), or a 10% chance of happening in any one year;
- Medium likelihood: a flood event is likely to occur in the defined area on average more than once in every two hundred years (1:200), or a 0.5% chance of happening in any one year; and
- Low likelihood: a flood event is likely to occur in the defined area on average more than once in every thousand years (1:1000), or a 0.1% chance of happening in any one year.

10.6.35 A summary of the potential sources of flooding and a review of the potential risks posed by each source is presented in **Table 10.6**.

Table 10.6: Potential Flooding Sources

Potential Source	Potential Flood Risk to Application Site	Justification
Coastal flooding	No	The Proposed Development is remote from the coast and at an elevation above 50 m Above Ordnance Datum (AOD). SEPA flood mapping confirms the Proposed Development is not at risk from tidal or coastal flooding.
River Flooding	Yes (localised)	Floodplain extents published by SEPA are shown on **Figure 10.1** which shows that the floodplain extents associated with watercourses crossed by the Proposed Development are generally local and do not extend far from the watercourses or lochs. Areas of high risk of flooding are located along the following watercourses which are crossed by the Proposed Development; Aldernaig Burn and Allt Dail a'Chuirn (a tributary of the Invervigar Burn). A larger area of flooding (out width of the watercourse channel is noted) associated with the Allt Dail a'Chuirn (a headwater tributary of the Invervigar Burn).
Surface Water Flooding	No	SEPA flood maps indicate that the majority of the Proposed Development is not at risk from surface water flooding, however, small discrete areas of flooding are shown which are associated with watercourse channels and small topographic lows. Surface water flooding is not considered to be a design constraint and potential effects can be mitigated by good design.

Potential Source	Potential Flood Risk to Application Site	Justification
Groundwater Flooding	No	The SEPA groundwater flood map illustrates that the Proposed Development is not considered at risk from potential groundwater flooding. This concurs with the desk-based assessment which has shown that there is little potential for significant groundwater.
Flood Defence Breach (Failure)	No	The Proposed Development is remote from any flood defences.
Flooding from artificial drainage systems	No	The Proposed Development is located within a remote area absent of artificial drainage systems.
Flooding due to infrastructure failure	No	SEPA has produced reservoir inundation maps for those sites currently regulated under the Reservoirs Act 1975. Review of these maps indicates five breach scenarios have been recorded along Loch Oich and River Oich downstream of the Proposed Development, associated with breaches from Quoich Reservoir, Loch Lundie, Invergarry Reservoir, and Loch Oich. In general the modelled flood extents do not encroach to the Proposed Development and given the safeguards afforded by the Reservoirs Act the risk of such an event occurring is very low. Therefore flooding from this source is not considered further.

Private Water Supplies and Licenced Sites (Abstractions / Discharges / Waste)

Private Water Supplies

10.6.36 As part of this assessment, a data request was made to THC who provided details of Private Water Supplies (PWS) sources. This has been supplemented with the most recent PWS data available on the Scottish Government spatial database[15]. In addition, a programme of site investigation has been undertaken to confirm the location of PWS sources and location of DWPA abstraction points.

10.6.37 Consultation undertaken with Scottish Water as part of the Skye Reinforcement Project[16] and for this Proposed Development (see **Table 10.1**) confirmed that the surface waters that drain the Proposed Development lie within the Loch Ness and the Aldernaig Burn catchment water supply catchment areas. Loch Ness supplies the Invermoriston Water Treatment Works. The Aldernaig Burn supplies water to the Invergarry Water Treatment Works Scottish Water has confirmed that the Ness catchment is large and that the proposed works are sufficiently distant from the intake so as to afford a low risk to the abstraction, but that water quality protection measures would need to be implemented to ensure the public water source is not impaired.

10.6.38 Confirmed PWS locations and DWPA extents within the study area are shown on **Figure 10.1**.

10.6.39 The risk the Proposed Development poses to PWSs and DWPAs (including the Aldernaig Burn DWPA) has been considered as part of this assessment and is presented as **Technical Appendix 10.3** (Drinking Water Protected Area and Private Water Supply Risk Assessment). It confirms PWS and DWPA sources that are at

[15] Scottish Government (2021) Private Water Supplies within the Highland Council Area, available https://data.gov.uk/dataset/6e78286f-2014-4a2c-aefa-c1379b9f7199/private-water-supplies-within-the-highland-council-area [Accessed February 2023]
[16] Planning Application ECU000043395

potential at risk from the Proposed Development and the safeguards that will be required at these locations to maintain the integrity and quality of the water supplies.

10.6.40 SEPA CAR authorisations were obtained from SEPA's environmental database[17]. Those recorded in the study area, the majority of which are located near the existing Fort Augustus Substation, are shown on **Figure 10.1**. SEPA was not able to provide details of the authorisations at the time of reporting. Two CAR authorisations are noted associated with the Loch Lundie Reservoir (RES/R/1128062) and Glen Buck Hydro Scheme (CAR/L/1112395). It is likely that the licenced activity at Loch Lundie is a water abstraction or impoundment authorisation (or a complex licence which regulates both). Glen Buck Hydro Scheme is within a different catchment to the Proposed Development.

Future Baseline

10.6.41 Due to consent in perpetuity, which is proposed, the temporal scope requires the consideration of the potential for climate change to impact on future baseline conditions. Climate change studies predict a decrease in summer precipitation and an increase in winter precipitation alongside slightly higher average temperatures. This suggests that there may be greater pressures on water supplies and water levels in summer months in the future. In addition, summer storms are predicted to be of greater intensity. Therefore, peak fluvial flows associated with extreme storm events may also increase in volume and velocity.

Summary of Sensitive Geology, Soils and Water Receptors

10.6.42 **Table 10.7** outlines the receptors identified as part of the baseline study, and their sensitivity based upon the criteria contained in **Table 10.2**. These receptors form the basis of the assessment, and as per the previously introduced methodology, are used in conjunction with an estimate of the magnitude of an effect to determine significance.

10.6.43 While a catchment carries a high sensitivity if PWS's and DWPA's are present, the risk to PWS's and DWPA's is assessed at an individual source level. This allows for a more detailed risk assessment of individual sources based upon the proposed design layout. All PWS's and DWPA's are afforded a 'high' sensitivity classification. See **Technical Appendix 10.3** (Drinking Water Protection Area and Private Water Supply Risk Assessment).

10.6.44 **Table 10.7** outlines the receptors identified as part of the baseline study, together with a description of their sensitivity to potential impacts associated with electricity infrastructure development.

Table 10.7 Sensitivity of Receptors

Receptor	Sensitivity	Reason for Sensitivity
Peat and Carbon Rich Soils	High	Discrete and shallow areas of peat and carbon rich soils have been confirmed by site investigation. These are important carbon stores and need to be safeguarded.
Superficial and Solid Geology	Not Sensitive	Deposits have been shown to be common regionally and have no rarity value.
Water Dependent Statutory Designated Sites	High	Western Inverness-shire Lochs SSSI and SPA is located downstream of the Proposed Development.
Groundwater	High	Groundwater has been classified by SEPA as Good and vulnerability is classified as Medium to High.

[17] SEPA Environmental data, available at https://www.sepa.org.uk/environment/environmental-data/ [Accessed February 2023]

Receptor	Sensitivity	Reason for Sensitivity
Groundwater Dependent Terrestrial Ecosystems	Assessed in **Chapter 8: Terrestrial Ecology**	
Surface water	High	The majority of surface water watercourses have been classified by SEPA as Good and the Aldernaig Burn catchment has been designated as a DWPA. Scottish Water has also confirmed that the Proposed Development lies within the Ness surface water public abstraction supply catchment.
Flooding	Medium	Minor floodplains have been identified adjacent to the larger watercourses crossed by the Proposed Development.
Drinking Water Protection Areas and Private Water Supplies	High	It has been confirmed that the Proposed Development crosses and lies within the catchment of two DWPAs. Properties have been identified to be served by a PWS that are downgradient of the Proposed Development.
Licenced sites	Not Sensitive	It is noted that there is a licenced activity at Loch Lundie, which might be regulated water abstraction. Loch Lundie has been identified as a high sensitivity receptor above and is not assessed again.

10.7 Embedded Mitigation and Mitigation by Design

10.7.1 Mitigation has been developed as the project design has progressed through the route and alignment selection, and EIA stages of the project. The impact assessment and mitigation process has been iterative and therefore mitigation has been developed for the design to be as specific as possible and as an assumed part of the OHL and associated infrastructure. This process has included, for example, using existing access tracks where possible, citing infrastructure generally in areas that avoid ecologically and hydrologically sensitive areas where practicable. In addition to the mitigation embodied in the design and routeing of the project, best practice construction measures have also been developed to ensure that disturbance and pollution during construction is avoided.

10.7.2 A description of all elements of the Proposed Development is given in **Chapter 3: Project Description**. Embedded mitigation and mitigation by design relevant to the water environment is presented below.

Good Practice Measures

10.7.3 As a principle, preventing the release of any pollution/sediment is preferable to dealing with the consequences of any release. There are several general measures which cover all effects assessed within this Chapter, details are given below.

10.7.4 The Proposed Development will be constructed in accordance with good practice guidance, including UK and Scottish guidance on good practice for construction projects as detailed earlier in this Chapter.

10.7.5 In addition, the Applicant has established best practice construction techniques and procedures that have been agreed with statutory consultees, including SEPA and NatureScot. These are set out within the Applicant's General Environmental Management Plans (GEMPs) included in **Technical Appendix 3.3**. The Proposed Development would be constructed in accordance with these plans.

Construction and Environmental Management Plan

10.7.6 A contractual management requirement of the successful Principal Contractor would be the development and implementation of a comprehensive and site-specific CEMP. This document would detail how the successful Principal Contractor would manage the works in accordance with all commitments and mitigation detailed in the EIA Report, Applicant's GEMPs, statutory consents and authorisations, and industry best practise and guidance, including pollution prevention guidance.

10.7.7 The CEMP will also outline measures to ensure that the works minimise the risk to groundwater, surface water, private water supplies, DWPA's and licensed water uses.

10.7.8 It is expected that the following will be included in the CEMP and would ensure the works are undertaken in accordance with good practice guidance, which includes, but is not limited to the following:

- measures to protect and safeguard private water supplies, DWPA's and associated distribution pipework;
- any above ground on-site fuel and chemical storage would be bunded;
- emergency spill response kits would be maintained during the construction works;
- a vehicle management system would be put in place wherever possible to reduce the potential conflicts between vehicles and thereby reduce the risk of collision;
- suitable access routes will be chosen which minimise the potential requirement for either new access tracks or for tracking across open land which could contribute to the generation of suspended solids;
- a speed limit would be used to reduce the likelihood and significance of any collisions;
- drip trays will be placed under vehicles which could potentially leak fuel/oils;
- any temporary construction / storage compounds required will be located remote from any sensitive surface water receptors or private water supplies and will be constructed to manage surface water run-off in accordance with best practice;
- any water contaminated with silt or chemicals will not be discharged directly or indirectly to a watercourse without prior treatment; and
- water for temporary site welfare facilities will be brought to site, and foul water will be collected in a tank and collected for offsite disposal at an appropriately licensed facility.

10.7.9 A wet weather protocol would be developed. This would detail the procedures to be adopted by all staff during periods of heavy rainfall. Tool box talks would be given to engineering/construction/supervising personnel. Roles would be assigned and the inspection and maintenance regimes of sediment and runoff control measures would be adopted during these periods.

10.7.10 In extreme cases, the above protocol would dictate that work onsite may have to be temporarily suspended until weather/ground conditions allow.

10.7.11 Further, Scottish Water best practice guidance for construction and land management practices in DWPA's will be adhered to and included in the CEMP.

Environmental Clerk of Works

10.7.12 To ensure all reasonable precautions are taken to avoid negative effects on the water environment, a suitably qualified Environmental Clerk of Works (ECoW) will be appointed prior to the commencement of construction to advise the Applicant and the Principal Contractor on all ecological and hydrological matters. The ECoW will be

required to be present onsite during the construction phase and will carry out monitoring of works and briefings with regards to any ecological and hydrological sensitivities on the Site to the relevant staff of the Principal Contractor and subcontractors.

10.7.13 With respect to the water environment, the ECoW would also have responsibility to ensure water flow paths and quality to water dependant habitat are sustained during all phases of the Proposed Development.

Safeguarding of Carbon Rich Soils and Peat

10.7.14 As required by NPF4, a detailed review of the distribution and depth of peat at the Site is contained in **Technical Appendix 10.1** (Peat Management Plan) and **Technical Appendix 10.2** (Peat Landslide Hazard Risk Assessment). The Proposed Development design has applied the mitigation hierarchy detailed in Policy 5 of NPF4 and specifically avoided areas of deep peat wherever possible and as a consequence only very limited amounts of peat would be encountered by the Proposed Development. It is shown that disturbed soils and peat can be readily managed and accommodated and would not be degraded. No surplus peat would be generated.

10.7.15 A Design and Geotechnical Risk Register would be compiled to include risks relating to peat instability.

10.7.16 Good construction practice and methodologies to prevent peat instability within areas that contain peat deposits are identified in the PLHRA. These include:

- measures to ensure a well-maintained drainage system, to include the identification and demarcation of zones of sensitive drainage or hydrology in areas of construction;
- minimisation of 'undercutting' of peat slopes, but where this is necessary, a more detailed assessment of the area of concern would be required;
- careful micro-siting of access track alignments to minimise effects on the prevailing surface and sub-surface hydrology;
- raising peat stability awareness for construction staff by incorporating the issue into the Site Induction (e.g. peat instability indicators and good practice);
- introducing a 'Peat Hazard Emergency Plan' to provide instructions in the event of a peat slide or discovery of peat instability indicators;
- developing methodologies to ensure that degradation and erosion of exposed peat deposits does not occur as the break-up of the peat top mat has significant implications for the morphology, and thus hydrology, of the peat (e.g. minimisation of off-track plant movements within areas of peat); and
- developing drainage systems that would not create areas of concentrated flow or cause over-, or under-saturation of peat habitats.

10.7.17 Notwithstanding any of the above good construction practices and methodologies, detailed design and construction practices would need to consider the particular ground conditions and the specific works at each location throughout the construction period. An experienced and qualified engineering geologist / geotechnical engineer would be appointed as a supervisor, to provide advice during the setting out, micro-siting and construction phases of the Proposed Development.

Buffer to Water Features

10.7.18 As part of the Proposed Development design, and with the exception of required watercourse crossings, a buffer of at least 20 m has been applied to watercourses and water features such as lochs and ponds.

Water Quality Monitoring (PWS, DWPA and Designated Sites)

10.7.19 It has been confirmed that the Proposed Development lies within two DWPA's and that surface water also supports a number of PWS sources.

10.7.20 Water quality monitoring before and during the construction phase would be undertaken of water sources which have been identified as potentially at risk from the Proposed Development, see **Technical Appendix 10.3 (**Drinking Water Protected Area and Private Water Supply Risk Assessment) without implementation of best practice measures.

10.7.21 The monitoring would be used to ensure that the quality and/or quantity of water to these sources is not significantly impacted. Monitoring would be carried out at a specified frequency (depending upon the construction phase) on these catchments. An example monitoring protocol is given in **Technical Appendix 10.3**.

10.7.22 As detailed in **Technical Appendix 10.3** it is expected that a water monitoring programme proportionate to the risk posed to a PWS source or DWPA area is adopted, with more monitoring (e.g. increased frequency and parameter suite) used at locations where the risk to a water source is greater.

10.7.23 This monitoring would continue throughout the construction phase and immediately post construction when works are undertaken near a water source. Monitoring would be used to allow a rapid response to any pollution incident and also to assess the impact of good practice or remedial measures. Monitoring frequency would increase during the construction phase if remedial measures to improve water quality were implemented. Water quality monitoring plans would be developed during detailed design (Scottish Water, SEPA, THC and NDSFB would be consulted on the plan) and would be contained within the CEMP.

10.7.24 The performance of the good practice measures would be kept under constant review by the water monitoring schedule, based on a comparison of data taken during construction with a baseline data set, sampled prior to the construction period.

10.7.25 Loch Lundie which is a component part of Western Inverness-shire Lochs SSSI and SPA has been identified as being in hydraulic continuity with the Proposed Development.

10.7.26 Water quality monitoring before and during the construction phase would be undertaken, to ensure that the tributaries of the main watercourses that discharge to this designated site have no significant water quality and/or quantity impacts. Monitoring would be carried out at a specified frequency (depending upon the construction phase) on these catchments, and, like the PWS and DWPA monitoring programme, would be agreed with statutory consultees including THC, NatureScot and SEPA.

Pollution Risk

10.7.27 Good practice measures in relation to pollution prevention would include the following:

- refuelling would take place at least 50 m from watercourses and where possible it would not occur when there is risk that oil from a spill could directly enter the water environment. For example, periods of heavy rainfall or when standing water is present would be avoided;
- foul water generated onsite would be managed in accordance with PPG4;
- areas would be designated for washout of vehicles which are a minimum distance of 50 m from a watercourse;
- washout water would also be stored in the washout area before being treated and disposed of;
- a vehicle management plan and speed limit would be strictly enforced onsite to minimise the potential for accidents to occur;
- if any water is contaminated with silt or chemicals, runoff would not enter a watercourse directly or indirectly prior to treatment;
- water would be prevented as far as possible, from entering excavations such as tower foundations;

- procedures would be adhered to for storage of fuels and other potentially contaminative materials in line with the Controlled Activity Regulations, to minimise the potential for accidental spillage; and
- a plan for dealing with spillage incidents would be designed prior to construction, and this would be adhered to should any incident occur, reducing the effect as far as practicable. This would be included in the final CEMP for the Proposed Development.

Erosion and Sedimentation

10.7.28 Good practice measures for the management or erosion and sedimentation would include the following:

- all stockpiled materials would be located out with a 50 m buffer from watercourses;
- water would be prevented as far as possible, from entering excavations such as tower foundations through the use of appropriate cut-off drainage;
- where the above is not possible, water would pass through a number of settlement lagoons and silt/sediment traps to remove silt prior to discharge into the surrounding drainage system;
- clean and dirty water onsite would be separated and dirty water would be filtered before entering the water environment;
- if the material is stockpiled on a slope, silt fences would be located at the toe of the slope to reduce sediment transport;
- the amount of ground exposed, and time period during which it is exposed, would be kept to a minimum;
- silt/sediment traps, single size aggregate, geotextiles or straw bales would be used to filter any coarse material and prevent increased levels of sediment. Further to this, activities involving the movement or use of fine sediment would avoid periods of heavy rainfall where possible; and
- the Applicant's construction personnel and the Principal Contractor would carry out regular visual inspections of watercourses to check for suspended solids in watercourses downstream of work areas.

Fluvial Flood Risk

10.7.29 It is proposed to adopt Sustainable Drainage Systems (SuDS) as part of the Proposed Development. SuDS techniques aim to mimic pre-development runoff conditions and balance or throttle flows to the rate of runoff that might have been experienced prior to development. Good practice in relation to the management of surface water runoff rates and volumes where new permanent tracks or temporary compounds and laydown areas are proposed would include the following:

- drainage systems would be designed to ensure that any sediment, pollutants or foreign materials which may cause blockages are removed before water is discharged into a watercourse;
- onsite drainage would be subject to routine checks to ensure that there is no build-up of sediment or foreign materials which may reduce the efficiency of the original drainage design causing localised flooding; and
- appropriate drainage would attenuate runoff rates and reduce runoff volumes to ensure minimal effect upon flood risk.

10.7.30 Further information on ground conditions and drainage designs would be provided in the final CEMP.

Water Abstraction

10.7.31 Abstraction of water for construction activities is not anticipated. If, however, a source of water is required for construction, an application for a CAR Licence would be made to SEPA and managed through the regulation of the CAR Licence(s). Should a suitable source not be identified, a water bowser would be used.

10.7.32 Good practice that would be followed in addition to the CAR Licence regulations includes:

- water use would be planned so as to minimise abstraction volumes;
- water would be re-used where possible;
- abstraction volumes would be recorded; and
- abstraction rates would be controlled to prevent significant water depletion in a source.

Permanent Watercourse Crossings

10.7.33 Good practice in relation to new water crossings involves the following aspects:

- the design of the watercourse crossings would be agreed with SEPA prior to construction and be regulated in accordance with CAR;
- the appropriate crossing type would be identified from SEPA's good practice guidance and would consider geomorphological, ecological and hydrological constraints; and
- the crossing would be sized and designed so as to minimise effect upon flood risk (sized to accommodate at least the 200 year flow).

Temporary Access Tracks

10.7.34 In general, proposed construction site access would be taken via the existing public road network and would make use of existing forest and estate tracks as far as practicable, upgraded as required.

10.7.35 The majority of access will be achieved through upgrade of existing and installation of new tracks. Floating stone road construction may be installed in sensitive areas such as over deeper areas of peat. All new tracks would be constructed in accordance with best practice construction methods, and with reference to NatureScot's good practice guide on constructing tracks in Scottish uplands[18].

10.7.36 Fording will be used where an appropriate crossing point is already in place (on current tracks) with a suitable bed for crossing (where necessary the bed will be protected by the installation of bog mats or similar for running on). Fording will only be used where limited traffic is expected and impacts on the bed and crossing point generally will be monitored with appropriate mitigation being implemented if required.

10.7.37 For watercourses less than 2 m wide, General Binding Rules will be adhered to. Bog mats, or similar, will be positioned across the watercourse to enable access, where necessary, side rails will be installed with silt mitigation at either end and across if required to ensure that silt impacts from vehicles crossing are controlled at all times. Crossings will be cleaned at the end of the day if required.

10.7.38 Where possible large water crossings will be avoided by works being accessed and undertaken on either side of the watercourse. Appropriate protection measures (trestles and tables, pilot lines and supports etc.) will be implemented for conductor works to ensure that conductor does not enter the watercourse.

10.7.39 Once access routes have been confirmed, water crossing requirements will be assessed in advance of works with regards to compliance with the CAR and any required authorisations will be gained prior to works progressing – at this time it is expected that all works will be able to be completed under appropriate General Binding Rules (GBRs).

10.7.40 All proposed crossing locations and methodologies would be reviewed and approved by the ECoW, prior to any works being undertaken.

Dismantling the Existing 132 kV Overhead Transmission Lines and Temporary Diversion

10.7.41 To dismantle the redundant sections of the existing 132 kV Fort Augustus to Fort William OHL and 132 kV Invergarry Tee OHL and the temporary diversion to the 132 kV Fort Augustus to Fort William OHL (once

[18] Constructed Tracks in the Scottish Uplands. Scottish Natural Heritage, September 2015.

decommissioned), access to each tower or pole location would be required. In the majority of cases, this would require access by tracked vehicles to each location. As stated in **Chapter 3: Project Description** existing access tracks would be utilised as far as practicable.

10.7.42 Measures detailed above for the control and prevention of pollution, erosion and sedimentation apply to the use of tracks during the proposed dismantling works.

10.7.43 For the temporary 132 kV diversion to the 132 kV Fort Augustus to Fort William OHL, the Trident wood pole foundations would be made up of the poles themselves plus some additional steel and timber below ground level. Once this diversion can be decommissioned, the extraction method would be to dig down and remove the poles and backfill.

10.7.44 For the132 kV Fort Augustus to Fort William OHL and 132 kV Invergarry Tee OHL, for each steel lattice tower location where an excavator can achieve access, the foundations would be removed to below ground level.

10.7.45 Removal of conductors from the existing OHL would be undertaken with minimum disturbance to watercourses. Where conductors need to be pulled across watercourses, this operation would be undertaken swiftly and with minimum disturbance to riparian habitats or stream beds. All dismantling works would be supervised by the project ECoW.

Temporary OHL Wood Pole and Permanent Trident Steel Pole Construction

10.7.46 The following measures are proposed to mitigate the effects of temporary wood pole and steel pole foundation construction on the water environment:

- poles would be located and excavated wherever possible in the driest locations with well consolidated superficial geology, and wetland areas such as deep peat would be avoided. Wherever possible, poles would not be located within 20 m of waterbodies or watercourses;
- poles would be located out with floodplains to reduce potential effects on flooding;
- where excavations for poles encounter localised limited quantities of groundwater or become flooded due to surface water runoff or heavy rainfall, appropriate treatment of dewatering would be instigated under direction of the site ECoW;
- no dewatering discharge would be permitted directly adjacent to watercourses;
- unless directed otherwise by the site ECoW, dewatering discharge would drain across buffer areas of vegetation (e.g. grassland, heather) of at least 20 m width, which would provide for natural attenuation and dispersal of the flow and removal of silt;
- where no suitable vegetation is available for natural treatment of dewatering, the discharge would be passed through on-site settling tanks/lagoons prior to discharge by soakaway or to watercourse;
- the requirement for dewatering would be minimised in all locations by timely and efficient excavation of the foundation void and subsequent backfilling;
- excavated soils would be used to restore each foundation and be placed in the order they were removed from the foundation;
- turves would be used to dress the restored foundations; and
- all procedures for dewatering would be agreed by the Principal Contractor with SEPA, THC and NatureScot in CEMP.

Permanent Steel Lattice Tower Foundation Construction

10.7.47 The following measures are proposed to mitigate the effects of tower foundation construction on the water environment:

- tower foundations would be located and excavated wherever possible in the driest locations with well consolidated superficial geology, and wetland areas such as deep peat would be avoided. Wherever possible, towers would not be located within 20 m of waterbodies where possible;
- wherever possible, towers would be located outwith floodplains to reduce potential effects on flooding;
- where excavations for tower foundations encounter localised limited quantities of groundwater or become flooded due to surface water runoff or heavy rainfall, appropriate treatment of dewatering would be instigated under direction of the site ECoW;
- no dewatering discharge would be permitted directly adjacent to watercourses;
- unless directed otherwise by the site ECoW, dewatering discharge would drain across buffer areas of vegetation (e.g. grassland, heather) of at least 20 m width, which would provide for natural attenuation and dispersal of the flow and removal of silt;
- where no suitable vegetation is available for natural treatment of dewatering, the discharge would be passed through on-site settling tanks/lagoons prior to discharge by soakaway or to watercourse;
- the requirement for dewatering would be minimised in all locations by timely and efficient excavation of the foundation void and subsequent concrete pouring and backfilling;
- excavated soils would be used to restore foundations and be placed in the order they were removed from the foundation;
- turves would be used to dress the restored foundations;
- all procedures for dewatering would be agreed by the Principal Contractor with SEPA, THC and NatureScot and detailed within the CEMP; and
- the Principal Contractor would develop a method statement to address the transport, transfer, handling and pouring of liquid concrete at tower foundation sites.

Concrete Batching, Transport and Pouring

10.7.48 In relation to works involving concrete batching, transport and pouring, the following mitigation would be adopted:

- where concrete transfers are required, measures would be adopted at the point of concrete transfer to prevent accidental spillage of liquid concrete and no transfers would be undertaken in proximity to watercourses or areas of standing water;
- there would be no wash-out of concrete carrying vehicles at tower foundation sites (except the concrete chute) with wash-out undertaken at the nearest compounds where suitably bunded/protected facilities would be provided. Chutes would be washed out to a suitable container, allowed to settle and disposed at suitably licensed facilities;
- excess concrete or wash-out liquid would not be discharged to drains or watercourses. Drainage from washout facilities would be collected and treated or removed to an appropriate treatment point/licensed disposal site; and
- vehicles and plant working at tower foundations would be confined to the area required for safe working only to prevent compaction, rutting and habitat damage to adjacent areas of land. Working areas would be clearly marked out and temporary fencing used where risk assessments indicate a requirement. Similar procedures would be adopted to demarcate areas where plant access is required for conductor stringing and tensioning works,

Forest Felling

10.7.49 Where felling is required to construct and operate the OHL, this would be undertaken in accordance with best practice guidance published by FLS and overseen by the project ECoW.

10.8 Assessment of Likely Significant Effects

10.8.1 The assessment of effects is based on the Proposed Development description outlined in **Chapter 3: Project Description** and is structured as follows:

- construction effects of the Proposed Development (which includes dismantling effects associated with the existing OHLs and the construction of the temporary OHL pole diversions); and
- operational effects of the Proposed Development.

Construction Effects

10.8.2 Potential construction impacts on hydrology and the aquatic environment have been considered for the different phases of the proposed project (construction, operation and dismantling). The impacts have been identified with reference to relevant guidance, through consultation and project team discussions, through targeted research on hydrological and water quality effects and by considering the information provided by the project engineers on infrastructure and construction methods.

10.8.3 The impacts of dismantling of the existing OHLs are less than those reported for construction of the new line and are of a shorter duration and are less intrusive. As a worst case, the proposed dismantling works are considered with the potential construction impacts.

10.8.4 During the construction phase the Proposed Development has the potential to result in the following effects without appropriate controls or mitigation:

- Adverse effects on carbon rich soils and peat through inappropriate handling and safeguarding;
- an adverse effect on surface water or groundwater quality from pollution, fuel, oil, concrete or other hazardous substances;
- potential adverse change of surface and groundwater flow paths and contribution to areas of peat and GWDTEs, water dependent habitat and water supplies;
- increased flood risk to areas downstream of the site through increased surface water runoff; and
- potential pollution impacts and adverse effect to private water supplies and DWPAs.

<u>Peat and Carbon Rich Soils</u>

10.8.5 The peat management plan (**Technical Appendix 10.1**) and peat landslide hazard risk assessment (**Technical Appendix 10.3**) presents the result of a detailed programme of site investigation and show that area of deeper peat and organic soils have been avoided by the design of the Proposed Development. This 'embedded mitigation' greatly reduces the potential adverse effect on peat and carbon rich soils.

10.8.6 Best practice measure to maintain the integrity and structure of peat and organic soils are given in the sections above. Peat and organic soils are considered highly sensitive receptors. The Proposed Development and proposed safeguards embedded in the development design reduce the magnitude of potential effect to low, during the construction phase. The significance of effect is therefore assessed as negligible. No additional mitigation, over and above that detailed in the peat management plan (**Technical Appendix 10.1**) and peat landslide hazard risk assessment (**Technical Appendix 10.3**) is required.

<u>Surface Water and Groundwater Quality</u>

10.8.7 As stated above, the Proposed Development would be undertaken in accordance with the Applicant's GEMPs and relevant technical guidance, PPG/GPPs and other codes of best practice, to limit the potential for contamination of both ground and surface waters. In addition, a site specific CEMP would be prepared by the Principal Contractor and would include a groundwater and surface water quality management plan.

10.8.8 The above measures would significantly reduce the likelihood of pollutants, including suspended solids, being discharged to nearby watercourses or groundwater.

10.8.9 The safeguards included in the Proposed Development design and the committed best practice construction techniques would also safeguard the quality of water which sustains water dependant habitat, DWPAs and PWS sources.

10.8.10 Surface water and groundwater are considered highly sensitive receptors. The Proposed Development and proposed safeguards embedded in the development design reduce the magnitude of potential effect to low, during the construction phase. The significance of effect is therefore assessed as negligible. No additional mitigation, over and above confirmatory monitoring, is therefore required.

Surface and Groundwater Flow

10.8.11 No significant deep or expansive earthworks are proposed when compared to surface and groundwater catchments at any location of the Proposed Development and therefore there will be no significant impact on catchment scale surface water or groundwater flows. Notwithstanding this, the best practice measures listed above would be included in the CEMP and would be used to control and manage surface and groundwater flows and maintain existing water flow paths at a local scale and be used to ensure water flow paths to PWS sources and water dependent habitat would be maintained.

10.8.12 Surface and groundwater are highly sensitive receptors. With these safeguards, the potential effect on ground and surface water flows is assessed as negligible and thus the resultant significance of effect is negligible. No additional mitigation, over and above confirmatory monitoring, is required.

Flood Risk

10.8.13 Areas of flood risk are considered to have a medium sensitivity. As part of the detailed site design the Principal Contractor will prepare a detailed construction method statement which will have regard to areas of known and potential flood risk. This will ensure no new permanent features which are sensitive to flooding is located within the floodplain.

10.8.14 It is proposed that access to the Proposed Development will use existing tracks and watercourse crossings wherever possible. Where permanent new access tracks or watercourse crossings cannot be avoided, the following measures will be implemented to protect surface water and groundwater quality as well as to mitigate a potential increase in flood risk:

- silt traps / check dams will be used to capture suspended solids generated during construction; and
- construction will be carried out in accordance with appropriate SEPA and CIRIA guidance.

10.8.15 The design and capacity of the watercourse crossings would be agreed by the Principal Contractor in consultation with SEPA as part of the detailed design.

10.8.16 With these safeguards the magnitude of potential effect is assessed as negligible and the resultant significance of effect is assessed as negligible. No additional mitigation is required.

Public and Private Water Supplies (inc. DWPA's)

10.8.17 The baseline assessment has confirmed that properties locally maintain private water supplies and that their some water sources lie close to or downstream of the Proposed Development. Micro-siting and good practice techniques that prevent pollution of surface water and maintain the integrity of the distribution pipework, will be required to safeguard these private water supplies.

10.8.18 The Proposed Development also crosses water catchments which are designated as DWPA's.

10.8.19 Both DWPA's and PWS sources are considered highly sensitive receptors. It is proposed therefore that prior to construction, as part of the detailed design stage of the project, a DWPA and PWS monitoring and protection strategy is prepared and agreed with Scottish Water, THC and SEPA.

10.8.20 A detailed assessment of the DWPA's and PWS sources is presented as **Technical Appendix 10.3 (**Drinking Water Protected Area and Private Water Supply Risk Assessment), and DWPA's and PWS sources identified at risk from the Proposed Development are identified.

10.8.21 With the best practice construction techniques to protect surface water and groundwater receptors outlined above, in combination with the proposed DWPA and PWS monitoring programme (see example in **Technical Appendix 10.3** (Drinking Water Protected Area and Private Water Supply Risk Assessment), the magnitude of potential effect is assessed as negligible and the resultant significance of effect is assessed as negligible. No additional mitigation is required.

Designated Sites within Hydraulic Connection to the Proposed Development

10.8.22 The baseline assessment has confirmed that Loch Lundie which is a component part of Western Inverness-shire Lochs SSSI and SPA is hydraulically connected to the Proposed Development.

10.8.23 The controls which would be adopted at site in accordance with best practice would ensure that the potential effect on the designated sites is negligible and thus the significance of effect is negligible. No additional mitigation is required.

Operation Effects

10.8.24 During the operational phase of the Proposed Development, it is anticipated that routine maintenance of infrastructure and tracks would be occasionally required.

10.8.25 During the operational phase the Proposed Development has the potential to result in the following effects without appropriate controls or mitigation:

- adverse changes to surface water flow paths, watercourse discharge rates and volumes, and alteration of watercourse geomorphology;
- as a result of an alteration of groundwater and surface water flow paths, an adverse effect on water abstractions and water dependent habitat;
- an adverse effect on surface water or groundwater quality from pollution, fuel, oil, concrete or other hazardous substances from site traffic associated with maintenance activities; and
- increased flood risk through increased surface water runoff from new impermeable areas.

10.8.26 Should any maintenance be required onsite which would involve construction activities method statements would be developed and used which will adopt the best practices agreed with regulators as part of the construction phase CEMP.

Peat and Carbon Rich Soils

10.8.27 During the operational phase there will be no requirement to undertake earthworks which could impair peat or carbon rich soils. In unlikely event earthworks are required these would be undertaken using the same controls and safeguards which would be used during the construction phase.

10.8.28 The likelihood, magnitude of impact and duration of works which have the potential to impair peat or carbon rich soils would be negligible following adherence to good practice measures. Therefore, the potential significance of effect on peat and carbon rich soils is negligible. No mitigation is, therefore, required.

Surface Water and Groundwater Quality

10.8.29 The possibility of a pollution event, resulting in impairment of surface water or groundwater impairment, occurring during operation is very unlikely as there would be a limited number of vehicles required onsite for routine maintenance.

10.8.30 Any maintenance activities would be undertaken using the same controls agreed with statutory consultees and deployed during the construction phase, including adherence to a CEMP, and supervision of all works. Further the scope of works which might be undertaken are no different to the work which would be undertaken during the construction phase.

10.8.31 Immediately post-construction, newly excavated drains and track dressings may be prone to erosion as any vegetation would not have matured. Appropriate design of the drainage system, incorporating sediment traps, would reduce the potential for the increased delivery of sediment to natural watercourses. Potential effects from sedimentation or erosion during the operational phase are considered to come from linear features on steeper slopes, where velocities in drainage channels are higher. Immediately post-construction, flow attenuation measures would remain and be maintained to slow runoff velocities and prevent erosion until vegetation becomes established.

10.8.32 An outline site restoration plan is presented as **Technical Appendix 3.4**. Restoration works would be undertaken in accordance with the best practice and safeguards detailed in this Chapter.

10.8.33 Based upon this, the potential risk associated with frequency, duration and likelihood of a pollution event is low. It is, therefore, anticipated that the magnitude of a potential effect on surface water or groundwater during the operational phase of the Proposed Development would be negligible, as no detectable change would likely occur. Therefore, the significance of effect during the operational phase of the Proposed Development is predicted to be negligible on surface water and groundwater. No further or additional mitigation, therefore, is required.

Surface and Groundwater Flow

10.8.34 During the operation of the Proposed Development, it is not anticipated that there would be any excavation or need to stockpile large volumes of soils, reducing the potential for effects on surface and groundwater flows. Should any excavation be required, this is likely to be limited and required for maintenance of tracks etc. Any excavation, handling and placement of material would be subject to the same safeguards that would be used during the construction phase of the project.

10.8.35 Should any non-routine maintenance be required at the sections of track crossing wet areas (defined visually onsite by a contractor or operational personnel) then the good practice measures as detailed for the construction phase would be required on a case-by-case basis. Extensive work at watercourse crossings/adjacent to the water environment may require approval from SEPA under the CAR (depending upon the nature of the activity).

10.8.36 The likelihood, magnitude and duration of works which have the potential to alter surface and groundwater flow paths would be negligible following adherence to good practice measures. Therefore, the potential significance of effect on surface and groundwater is negligible. No mitigation is, therefore, required.

Flood Risk

10.8.37 Culverts beneath permanent access tracks could become blocked without routine inspection or maintenance. Any reduction in conveyance could locally increase flood risk.

10.8.38 In accordance with the Applicants GEMP's proposed infrastructure would be subject to routine inspection, and if required maintenance. Where identified, any remedial works would be undertaken using the same controls and authorisations detailed above and would be deployed during the construction phase of the project.

10.8.39 The likelihood, magnitude of impact and duration of works which have the potential to alter surface and groundwater flow paths would be negligible following adherence to good practice measures. Therefore, the potential significance of effect on surface and groundwater is negligible. No mitigation is therefore required.

Private Water Supplies and DWPA's

10.8.40 Given the controls and assessment presented above, no significant effect on surface water or groundwater quality or flow is anticipated during the operational phase of the development. Accordingly, the potential significance of effect on PWS sources and DWPA's is assessed as negligible. No mitigation additional is therefore required.

Designated Sites within Hydraulic Connection to the Proposed Development

10.8.41 The controls which would be adopted at site during the operational phase and which are in accordance with best practice will safeguard surface water and groundwater quality, surface water and groundwater flows, and mitigate flood risk. They would ensure that the potential effect on that Loch Lundie which is a component part of Western Inverness-shire Lochs SSSI and SPA is negligible and thus the significance of effect is negligible.

10.8.42 No additional mitigation is required.

10.9 Mitigation

10.9.1 As there are no predicted likely significant effects under the terms of the EIA regulations, other than the good practice measures that the Applicant implement as standard, no specific mitigation, is required.

10.10 Residual Effects

10.10.1 No significant residual effects on surface water or groundwater receptors including designated water dependent sites, GWDTE, PWS sources and DWPAs are predicted during the construction and operation of the Proposed Development, nor associated with dismantling or rerouting of the existing OHL.

10.11 Summary of Effects

10.11.1 A summary of assessed effects and identified mitigation measures required to reduce the potential effects to acceptable levels are identified in **Table 10.8.**

Table 10.8 Summary of Effects and Proposed Mitigation Measures

Potential effect	Proposed mitigation / enhancements	Resultant Significance of Effect
Construction Phase (inc. rerouting and dismantling of the existing 132 kV OHLs)		
• Alteration of surface water or groundwater flow • Impairment of surface water or groundwater quality • Increase in flood risk • Impairment of PWS and DWPA supplies • Adverse effect on water dependent designated sites	• Mitigation by design • Good practice construction techniques • Confirmatory water quality monitoring	Negligible
Operation Phase		

Potential effect	Proposed mitigation / enhancements	Resultant Significance of Effect
No additional effects or mitigation / enhancement identified.		